

First Executive Session
Director's CD-2/3a Review of the
MINERvA Project

August 1-3, 2006
L. Edward Temple, Jr.

Agenda for Exec Session

- Charge to Reviewers
- Review Agenda
- Organization Charts
- DOE O 413.3 Attachment 4
- Cost/Schedule Review Guidance
- Reporting Out Structure
 - Findings, Comments, and Recommendations
- Assignments
 - Technical Reviewer Assignments
 - Breakout Groupings
- Cost / Contingency Table
- Discussion

Charge

This charge is for the Committee to conduct a Director's CD-2/3a Review of the proposed MINERvA project at Fermilab. The review is to assure that all the requirements have been met for DOE to approve CD-2/3a. Fermilab and MINERvA are planning for limited forward funded procurement in FY2007 so we need to achieve DOE CD-2/3a approval in early 2007.

As part of this assessment the questions listed in Attachment 1 of this charge should be addressed. Additionally the review committee is to review and comment on the Project's response and actions taken on the recommendations from the Director's CD-1 Review of MINERvA on December 13-15, 2005. Constructive comments on presentation content, format, and style are also requested.

Approval of CD-2 by DOE officials is based on a ***Preliminary Design or a Technical Design Report*** for the project, a ***cost and schedule baseline***, and some additional project management documents. The technical part of the review will focus on the technical designs for the Detector. It will answer the questions, ***will these designs meet the technical specifications and are the designs sound. The cost and schedule baselines are based on a detailed WBS – Work Breakdown Structure, WBS Dictionary, BOE – Basis of Estimate documentation, risk and contingency analyses, RLS – Resource Loaded Schedule, and time phased funding and cost profiles. The committee is asked to review each of these items, for quality, completeness, and accuracy.*** The CD-3a approval is sought to allow limited construction comprising specific long lead procurements. Furthermore, the committee is asked to ***review and assess the quality of and comment on the additional formal project management documentation required for CD-2/3a approval.***

Finally, the committee should present findings, comments, and conclusions at a closeout meeting with MINERvA's and Fermilab's management and provide a written report soon after the review.

Charge Attachment #1

Technical

- Are the technical specifications clearly stated and documented?
- Can the design be built? Does the design meet the technical specifications? Is it a reasonable design?
- Does the baseline design meet the project's objectives (mission need)?

Cost

- Is the Work Breakdown Structure (WBS) appropriate for the project scope?
- Do the cost estimates for each WBS (or cost) element have a sound documented basis and are they reasonable?
- Does an obligation profile exist and is it within the funding guidance profile?

Schedule

- Is the schedule well developed and appropriately structured by specifying relationships, predecessors, successors, critical path, resource loaded, etc?
- Are the durations for the activities and overall schedule reasonable and achievable with the assumed resources?
- Does the schedule contain appropriate levels of milestones, sufficient quantity of milestones for tracking progress and do they appear to be achievable?
- Does the schedule include activities for design reviews, which include assessment of the designs readiness for procuring prototypes, preproduction and production materials?

Charge Attachment #1 (continued)

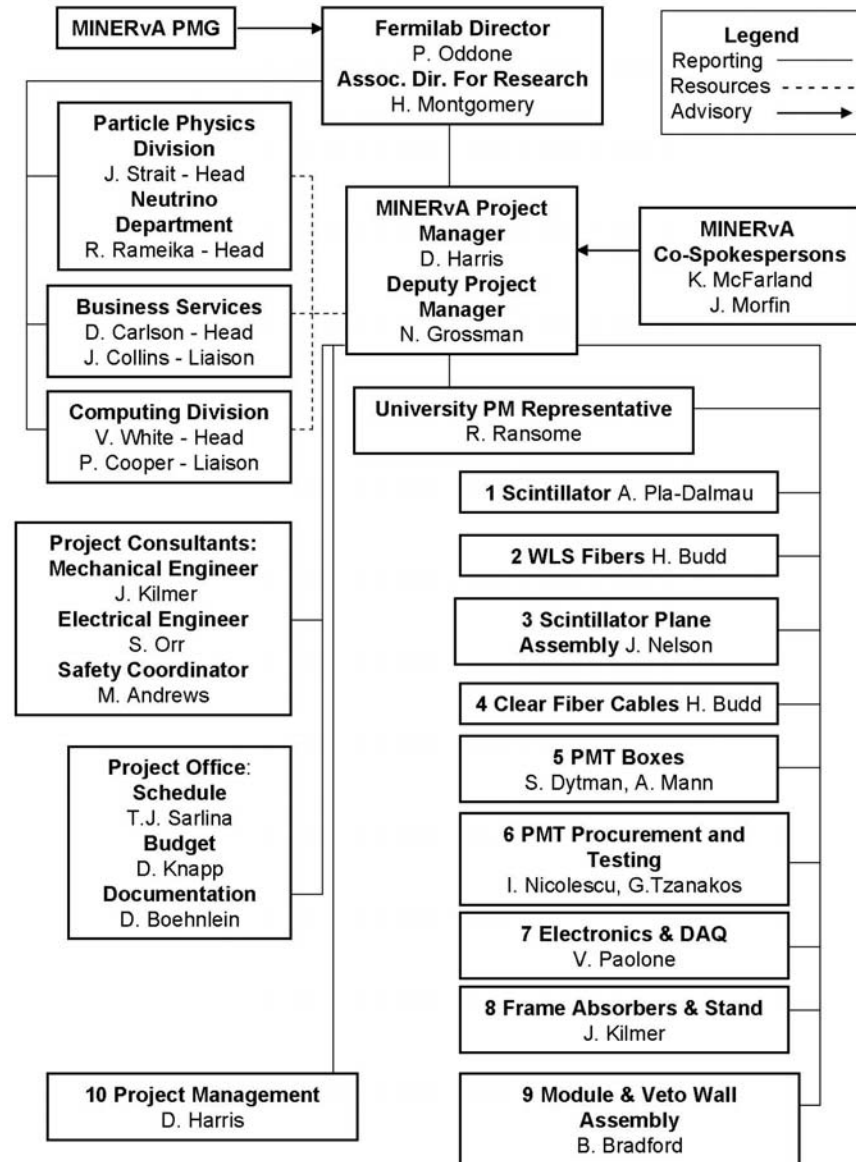
Management

- Is there an appropriate management organizational structure in place to accomplish the design and construction?
- Is the organization structure well documented, responsibilities defined and appropriate for the scope of work?
- Are there adequate staffing resources available or planned for this effort?
- Is there a funding plan available or proposed to meet the resource requirements to realize the project?
- Has a Risk Plan been developed, risks identified, risks analyzed, risks responses planned/implemented, risk monitoring/control process established and do they seem appropriate?

Procurement

- Have the critical procurements been identified and are they included in the schedule with adequate lead time built in?
- Have critical make vs. buy decisions been evaluated in conjunction with the scope and is that reflected in the baseline cost estimate, schedule and technical risk plan?
- Are the designs final and procurement packages prepared to the degree appropriate to initiate construction as scheduled?

MINERvA Organization



Agenda

Tuesday, August 1, 2006 – Open Session starts a 9:00 AM in 1 West

8:00 – 8:45 AM		Executive Session (Comitium-WH2SE)	Ed Temple
9:00 – 9:15 AM	15	Introduction	Hugh Montgomery
9:15 – 9:45 AM	30	Experiment Overview	Kevin McFarland
9:45 – 10:35 AM	50	Project Overview	Deborah Harris
10:35 – 10:50 AM	15	BREAK	
10:50 – 11:20 AM	30	WBS 1: Scintillator Extrusions	Anna Pla
11:20 – 11:50 AM	30	WBS 2 & 4: WLS Fiber and Clear Fiber Cables	Howard Budd
11:50 – 12:20 PM	30	WBS 3: Scintillator Plane Assembly	Jeff Nelson*
12:20 – 1:20 PM	60	LUNCH (WH2X)	
1:20 – 2:00 PM	40	WBS 5 & 6: PMT Boxes, PMT Acquisition and Testing	Ron Ransome
2:00 – 2:30 PM	30	WBS 7: DAQ and Electronics	Vittorio Paolone
2:30 – 2:45 PM	15	BREAK	
2:45 – 3:15 PM	30	WBS 8: Frame, Absorbers and Stand	Jim Kilmer
3:15 – 3:45 PM	30	WBS 9: Module Assembly	Bob Bradford
3:45 – 4:00 PM	15	Transition to Breakout Sessions	
4:00 – 5:00 PM	60	Breakout Sessions	
		WBS 1, 2 & 4 Scintillator & Fiber (Snake Pit – WH2NE)	Anna Pla, TJ Sarlina
		WBS 3, 8 & 9 Module/Plane, Detector Parts Assembly (Black Hole – WH2NW)	Jim Kilmer, Bob Bradford
		WBS 5, 6 & 7 PMT's, PMT Boxes and Electronics & DAQ (Racetrack – WH7X)	Vittorio Paolone, Ron Ransome
5:00 – 6:30 PM	90	Executive Session (Comitium – WH2SE)	

*Jeff Nelson via Conference Phone

Agenda (continued)

Wednesday, August 2, 2006 (Morning break will be available outside Comitium at 10:30)

8:00 – 8:30 AM	30	Cost & Schedule Executive Session (Comitium – WH2SE)	Ed Temple
8:30 – 12:30 PM		Breakout Sessions	
		• WBS 1, 2 & 4 Scintillator & Fiber (Snake Pit – WH2NE)	Anna Pla, TJ Sarlina
		• WBS 3, 8 & 9 Module/Plane, Detector Parts Assembly (Black Hole – WH2NW)	Jim Kilmer, Bob Bradford
		• WBS 5, 6 & 7 PMT's, PMT Boxes and Electronics & DAQ (Racetrack – WH7X)	Vittorio Paolone, Ron Ransome
		• WBS 10 Management/Cost/Schedule (Comitium WH2SE)	Deborah Harris, Nancy Grossman
12:30 – 1:30 PM		LUNCH (WH2X)	
1:30 – 2:30 PM		MINERvA's response to review committees questions (Comitium – WH2SE)	Deborah Harris, Nancy Grossman
2:30 – 6:00+ PM (Break at 3:45)		Executive Session and Report Writing (Comitium – WH2SE)	Ed Temple

Thursday, August 3, 2006

9:00 – 1:30 PM	Closeout Dry Run with working lunch (Comitium – WH2SE) Breaks taken as necessary.	Committee
1:30 PM	Closeout (1 West – WH7X)	

DOE O 413.3

Attachment 4

DOE O 413.3
10-13-00

Attachment 4
Page 1

PROJECT ACQUISITION PROCESS AND CRITICAL DECISIONS					
Project Planning Phase		Project Execution Phase			Mission
Preconceptual Planning	Conceptual Design	Preliminary Design	Final Design	Construction	Operations
CD-0	CD-1	CD-2	CD-3	CD-4	
Approve Mission Need	Approve Preliminary Baseline Range	Approve Performance Baseline	Approve Start of Construction	Approve Start of Operations or Project Closeout	
<i>See Page 2 for CDs on Environmental Restoration and Facility Disposition Projects</i>					
CD-0	CD-1	CD-2	CD-3	CD-4	
Actions Authorized by Critical Decision Approval					
<ul style="list-style-type: none"> Proceed with conceptual design using program funds Request PED funding 	<ul style="list-style-type: none"> Allow expenditure of PED funds for design 	<ul style="list-style-type: none"> Establish baseline budget for construction Continue design Request construction funding 	<ul style="list-style-type: none"> Approve expenditure of funds for construction 	<ul style="list-style-type: none"> Allow start of operations or project closeout 	
Critical Decision Prerequisites					
<ul style="list-style-type: none"> Justification of mission need document Acquisition Strategy Preconceptual planning Mission Need Independent Project Review 	<ul style="list-style-type: none"> Acquisition Plan Conceptual Design Report Preliminary Project Execution Plan and baseline range Project Data Sheet for design Verification of mission need Preliminary Hazard Analysis Report 	<ul style="list-style-type: none"> Preliminary design Review of contractor project management system Final Project Execution Plan and performance baseline Independent cost estimate National Environmental Policy Act documentation Project Data Sheet for construction Draft Preliminary Safety Analysis Report Performance Baseline External Independent Review 	<ul style="list-style-type: none"> Update Project Execution Plan and performance baseline Final design and procurement packages (**) Verification of mission need Budget and congressional authorization and appropriation enacted Approval of Safety documentation Execution Readiness Independent Review 	<ul style="list-style-type: none"> Operational Readiness Review and acceptance report Project transition to operations report Final Safety Analysis Report <hr/> <p>After CD-4</p> <p><u>Closeout</u></p> <ul style="list-style-type: none"> Project closeout report 	

(**) To the degree appropriate to initiate construction as scheduled.

01-Aug-06

Director's CD-2/3a Review of the
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CD-2 and CD-3 Review Criteria

(Excerpt from DOE M 413.3-1 (3-28-03))

Performance Baseline Review (CD-2)	Construction or Execution Readiness Review (CD-3)
<p>Key review elements for a Performance Baseline Review are:</p> <ul style="list-style-type: none"> - System Functions and Requirements - Preliminary Design and Design Review - Work Breakdown Structure - Resource Loaded Schedule - Total Project Cost and Project Schedule - Risk Management - Project Execution Plan - Acquisition Strategy - Integrated Project Team - Hazards Analysis - Value Management/Engineering - Project Controls/Earned Value Management System 	<p>Key review elements for a Construction or Execution Readiness Review are:</p> <ul style="list-style-type: none"> - Final Design Functions and Requirements/Site Final Design Review - Final Drawings and Specifications - Construction/Execution Planning - Resource Loaded Schedule - Risk Management - Project Execution Plan - Acquisition Strategy - Integrated Project Team - Value Management/Engineering - Project Controls/Earned Value Management System
<p>The following documents are to available and assessed:</p> <ul style="list-style-type: none"> - System Functions and Requirements Document (also referred to as the “Design-to” requirements or Design Criteria) - Results of and Responses to Site Preliminary Design Review - Detailed Resource Loaded Schedule - Detailed Cost Estimate - Risk Management Assessment - Project Execution Plan - Acquisition Strategy - Hazards Analysis - <i>Preliminary Safety Analysis Document</i> 	<p>The following documents are to available and assessed:</p> <ul style="list-style-type: none"> - System Functions and Requirements Document - Final Design Drawings and Specifications - Results of and Responses to Site Final Design Review - Construction Planning Document - Detailed Resource Loaded Schedule - Detailed Cost Estimate - Risk Management Assessment - Project Execution Plan - Acquisition Strategy - Safety Documentation

Cost/Schedule Review Guidance

These are CD-2 Requirements.

The cost/schedule reviews are key elements of the CD-2 Performance (Technical, Cost, Schedule) Baseline Reviews.

- 1) This Director's Review*
- 2) Lehman DOE Review*
- 3) EIR – External Independent Review*

Project Technical, Cost, and Schedule Baseline Development

To Succeed in Cost / Schedule Arena

Estimate must be

Complete

Scope well understood and defined

Technical goal must be clear

Technology to be used to meet this goal known

Designate how technical systems will be acquired

I.e. buy, have fabricated, self fabricated

Buy parts / fabricate / assemble

How will this be accomplished

Self fabricate / assemble – lab or university(ies)

How will person power requirements be met

And paid for

All tasks defined and specified in a work breakdown structure

WBS dictionary

Documented at lowest level of WBS and include

M&S – materials and services

SWF – salaries, wages, & fringes

Accompanied by schedule showing appropriate durations

Adders – overheads / G&A (general & administrative)

Escalated – shown both with and without escalation with funding

profile based on laboratory/DOE/Federal

budget/appropriation guidance

Reviewer Assignments

Executive Summary	<u>Ed Temple</u>
1.0 Introduction	<u>Dean Hoffer</u>
2.0 Technical	
2.1 Science	<u>Jon Urheim,</u> <u>Jianming Qian</u>
2.2 Scintillator Extrusions, WLS Fiber and Clear Fiber Cables (WBS 1, 2 & 4) WBS 1 – Scintillator Extrusions WBS 2 – WLS Fiber WBS 4 – Clear Fiber Cables	<u>Jianming Qian</u> <u>Jon Urheim</u>
2.3 Plane Assembly, Outer Detector Frame, Absorbers, Stand and Module Assembly (WBS 3, 8 & 9) WBS 3 – Scintillator Plane Assembly WBS 8 – Frame Absorbers & Stand WBS 9 – Module & Veto Wall Assembly	<u>Mike Crisler,</u> <u>Joe Howell</u>
2.4 PMT's and PMT Boxes (WBS 5 & 6) WBS 5 – PMT Boxes WBS 6 – PMT Procurement and Testing	<u>Mike Lindgren,</u> <u>Hogan Nguyen</u>
2.5 Electronics & DAQ (WBS 7)	<u>Hogan Nguyen,</u> <u>Stu Fuess</u>
3.0 Project Management (WBS 10)	
3.1 Cost	<u>Marc Kaducak,</u> <u>Ken Domann,</u> <u>Dean Hoffer</u>
3.2 Schedule	<u>Ken Domann,</u> <u>Marc Kaducak,</u> <u>Dean Hoffer</u>
3.3 Management	<u>Elaine</u> <u>McCluskey,</u> <u>Dean Hoffer,</u> <u>Ed Temple</u>

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Reviewer Assignments (continued)

4.0 Charge Questions	
4.1 Are the technical specifications clearly stated and documented?	<u>Jon Urheim</u>
4.2 Can the design be built? Does the design meet the technical specifications? Is it a reasonable design?	<u>Jianming Qian</u>
4.3 Does the baseline design meet the project's objectives (mission need)?	
4.4 Is the Work Breakdown Structure (WBS) appropriate for the project scope?	<u>Marc Kaducak</u> / All
4.5 Do the cost estimates for each WBS (or cost) element have a sound documented basis and are they reasonable?	
4.6 Does an obligation profile exist and is it within the funding guidance profile?	
4.7 Is the schedule well developed and appropriately structured by specifying relationships, predecessors, successors, critical path, resource loaded, etc?	<u>Ken Domann</u> / All
4.8 Are the durations for the activities and overall schedule reasonable and achievable with the assumed resources?	
4.9 Does the schedule contain appropriate levels of milestones, sufficient quantity of milestones for tracking progress and do they appear to be achievable?	
4.10 Does the schedule include activities for design reviews, which include assessment of the designs readiness for procuring prototypes, preproduction and production materials?	

Reviewer Assignments (continued)

4.11 Is there an appropriate management organizational structure in place to accomplish the design and construction?	<u>Elaine McCluskey</u> / All
4.12 Is the organization structure well documented with responsibilities defined and appropriate for the scope of work?	
4.13 Are there adequate staffing resources available or planned for this effort?	
4.14 Is there a funding plan available or proposed to meet the resource requirements to realize the project?	
4.15 Has a Risk Plan been developed, risks identified, risks analyzed, risks responses planned/implemented, risk monitoring/control process established and do they seem appropriate?	
4.16 Have the critical procurements been identified and are they included in the schedule with adequate lead time built in?	<u>Dean Hoffer</u> / All
4.17 Have critical make vs. buy decisions been evaluated in conjunction with the scope and is that reflected in the baseline cost estimate, schedule and technical risk plan?	
4.18 Are the designs final and procurement packages prepared to the degree appropriate to initiate construction as scheduled?	

* Note underlined names are the primary writer.

Reviewer Assignments for Breakouts

WBS 1, 2 & 4 Scintillator & Fiber (Snake Pit – WH2NE)	Jianming Qian Jon Urheim
WBS 3, 8 & 9 Module/Plane, Detector Parts Assembly (Black Hole – WH2NW)	Mike Crisler Joe Howell
WBS 5, 6 & 7 PMT's, PMT Boxes and Electronics & DAQ (Racetrack – WH7X)	Mike Lindgren Hogan Nguyen Stu Fuess
WBS 10 Management/Cost/Schedule (Comitium WH2SE)	Elaine McCluskey Marc Kaducak Ken Domann Dean Hoffer Ed Temple

Reporting Structure

- Review findings, comments, and recommendations should be presented in writing at a closeout with the Collaboration and Fermilab management.
- Section for each “Level 2” WBS plus Cost, Schedule, Management and Science sections.

Findings, Comments, and Recommendations

- Findings
 - Findings are statements of fact that summarize noteworthy information presented during the review.
- Comments
 - Comments are judgment statements about the facts presented during the review. The reviewers' comments are based on their experiences and expertise.
 - The comments are to be evaluated by the project team and actions taken as deemed appropriate.
- Recommendations
 - Recommendations are statements of actions that should be addressed by the project team.
 - A response to the recommendation is expected and that the actions taken would be reported on during future reviews.

Examples of Findings, Comments, and Recommendations

[NOvA CD-1 Director's Review @ Fermilab]

Findings

- Adhesive choice has an impact on work schedule and ventilation system design. The baseline adhesive was listed as 3M2216 and was said to have a safety factor of 5 for buckling. However a Devcon adhesive was discussed a great deal also. The Devcon adhesive has a sheer strength which was approximately 150% better but it contained a toxic solvent which the 3M2216 did not.
- An adhesive dispenser will be used to apply the adhesive to attach the modules together and to attach the blocks together. The adhesive dispenser can't be defined until the adhesive is chosen.

Examples of Findings, Comments, and Recommendations (continued)

[NOvA CD-1 Director's Review @ Fermilab]

Comment

- Adhesive needs to be determined as quickly as possible to meet timelines. If the 3M2216 meets the design SF of 5 for buckling and over a SF of 4 for shear stress between the planes it seems like it should be used over the Devcon adhesive which has toxic solvent vapors. Adhesive choice will affect assembly and the building (exhaust required) requirements.

Recommendation

1. Determine which adhesive to use as soon as possible. This affects building design and assembly time.

Project's Cost & Contingency Estimate

WBS	Items	MINERvA's Cost Estimate AYk\$									
		Base w/Indirects			Contingency %			Contingency \$			Total Base w/Indirects
		M&S	Labor	Total	M&S	Labor	Total	M&S	Labor	Total	
M I E	1.0 Scintillator Extrusion	121	268	\$ 389	19%	25%	23%	\$ 24	\$ 67	\$ 90	\$ 480
	2.0 WLS Fibers	350	374	\$ 724	30%	21%	25%	\$ 104	\$ 80	\$ 183	\$ 907
	3.0 Scintillator Plan Assembly	208	655	\$ 864	48%	29%	34%	\$ 99	\$ 192	\$ 292	\$ 1,155
	4.0 Clear Fiber Cables	358	727	\$ 1,085	30%	37%	35%	\$ 109	\$ 267	\$ 376	\$ 1,461
	5.0 Photomultiplier Tube Boxes	148	395	\$ 543	21%	30%	28%	\$ 31	\$ 119	\$ 150	\$ 693
	6.0 Photomultiplier Tubes	1,114	194	\$ 1,308	33%	37%	34%	\$ 367	\$ 72	\$ 439	\$ 1,747
	7.0 Electronics and DAQ	922	101	\$ 1,024	35%	40%	35%	\$ 322	\$ 41	\$ 363	\$ 1,387
	8.0 Frames, Absorbers, Coil and Detector Stand	418	133	\$ 552	31%	28%	30%	\$ 129	\$ 37	\$ 166	\$ 718
	9.0 Module and Veto Wall Assembly & Installation	160	238	\$ 398	37%	20%	27%	\$ 60	\$ 49	\$ 108	\$ 506
	10.0 Project Management	62	1,230	\$ 1,292	163%	30%	36%	\$ 101	\$ 369	\$ 470	\$ 1,762
	Total MIE:	3,862	4,316	\$ 8,178	35%	30%	32%	\$ 1,346	\$ 1,291	\$ 2,637	\$ 10,815
OPC	R&D	1,587	2,794	\$ 4,382	41%	35%	37%	\$ 648	\$ 985	\$ 1,633	\$ 6,015
	Total OPC:	1,587	2,794	\$ 4,382	41%	35%	37%	\$ 648	\$ 985	\$ 1,633	\$ 6,015
	TPC:	5,449	7,110	\$ 12,559	37%	32%	34%	\$ 1,994	\$ 2,277	\$ 4,271	\$ 16,830

Notes:

Reviewer Write-ups

- Write-up template is posted on Director's Review Webpage.
http://www.fnal.gov/directorate/OPMO/Projects/MINERvA/DirRev/2006/08_01/review.htm
- Write-ups are to be sent to Terry Erickson at terickson@fnal.gov prior to 8:30 AM on Thursday, August 3 for the Closeout Dry Run
- A final report will be issued within 2 weeks after the closeout.

Discussion

- Questions and Answers